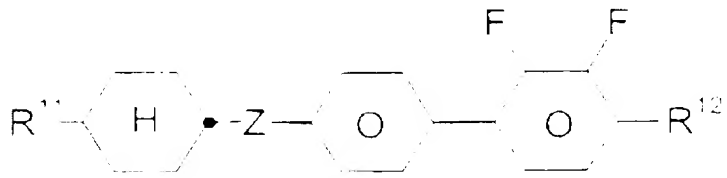
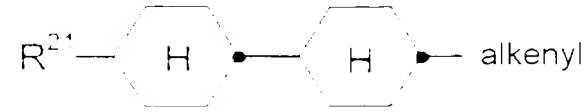
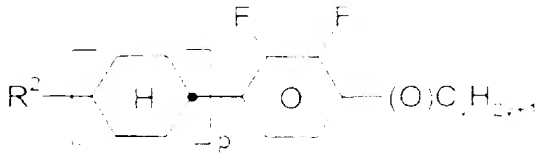
Liquid-crystalline medium



I1

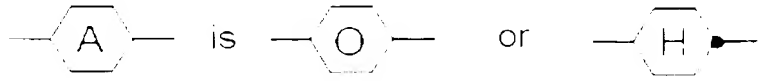


I2



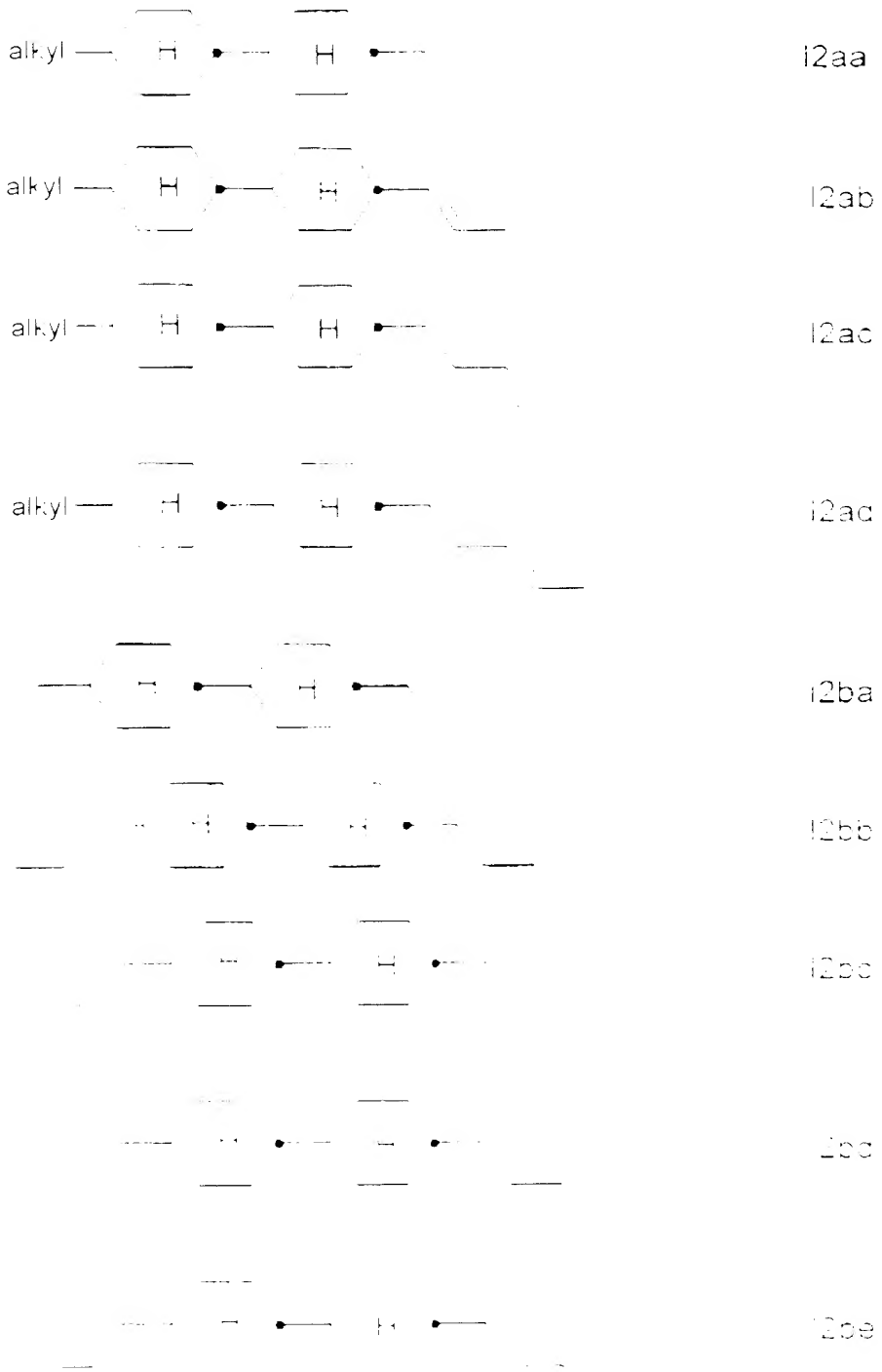
II

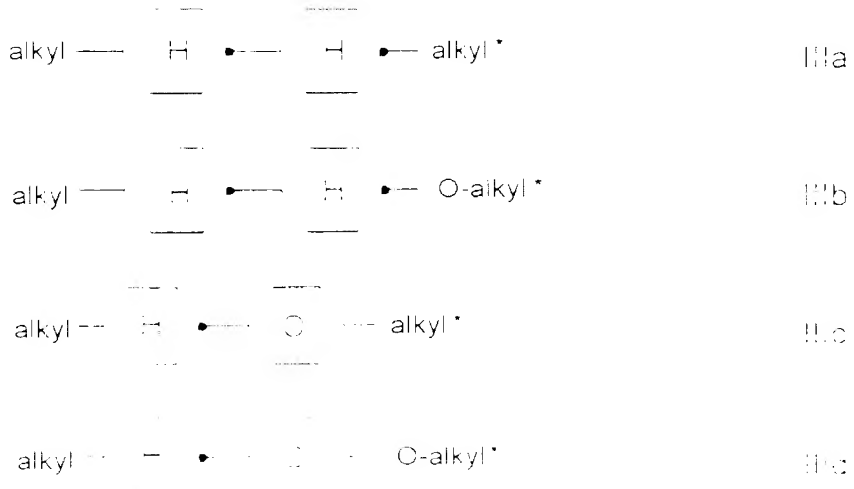
in which

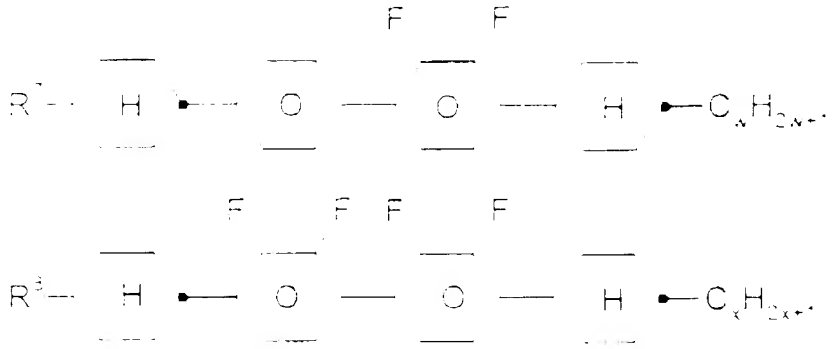


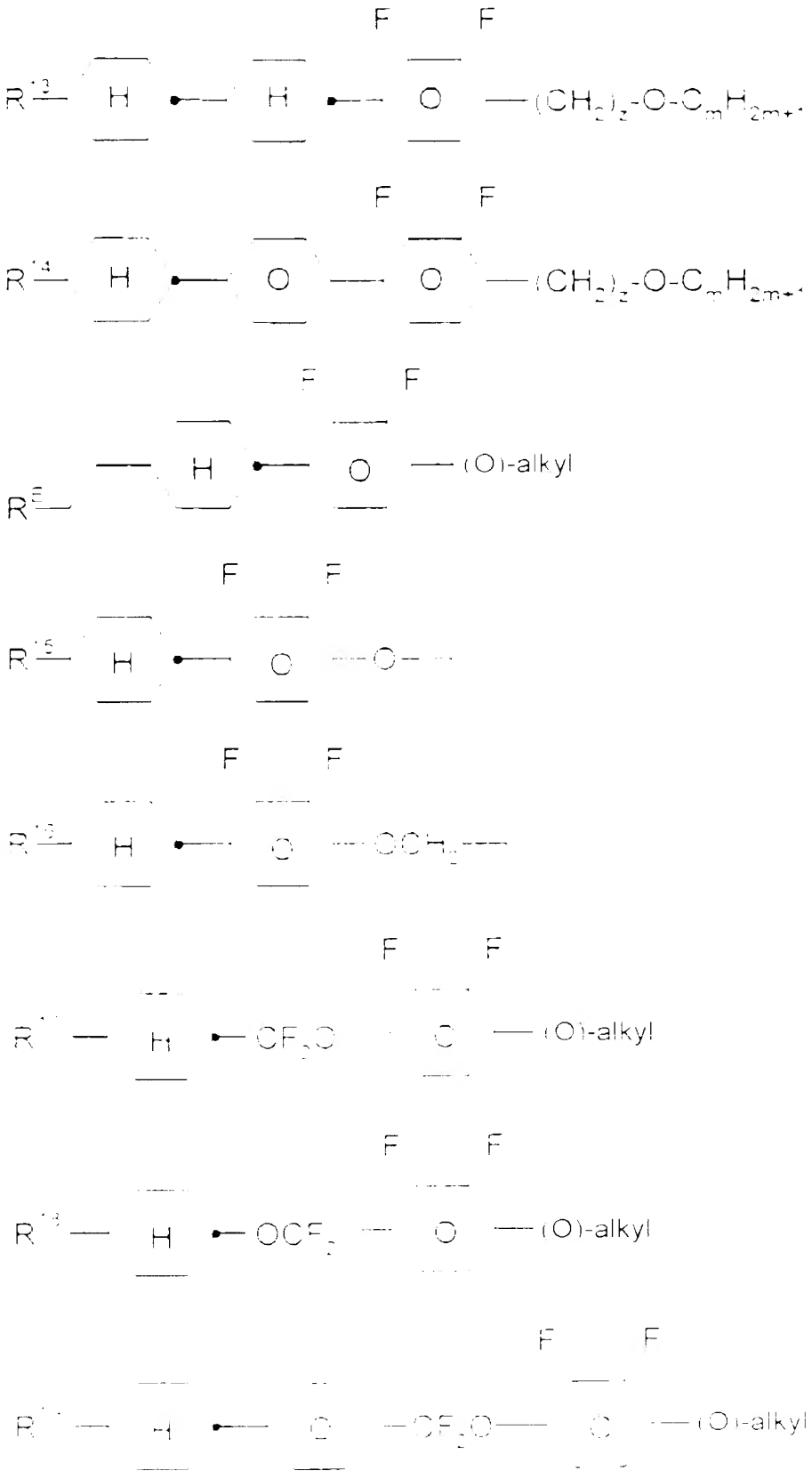
alkyl — H — H — alkenyl 12a

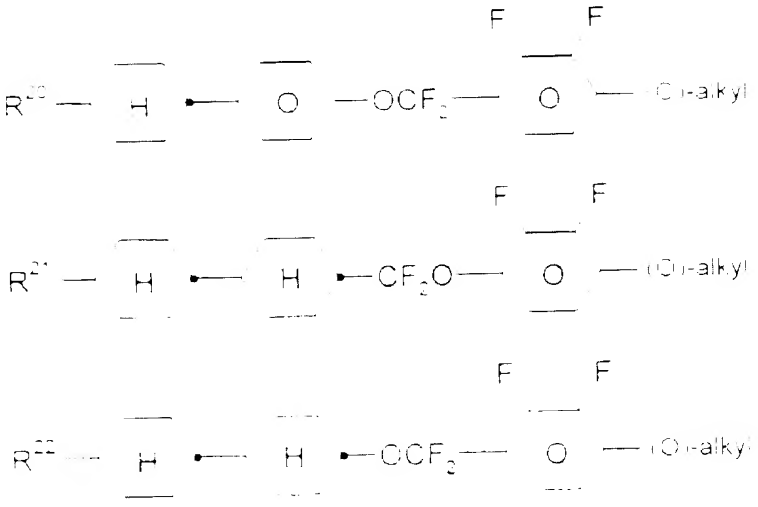
alkenyl — H — H — alkenyl' 12b


alkyl
H
H
I2aa
alkyl
H
H
I2ab
alkyl
H
H
I2ac
alkyl
H
H
I2ad
I2ba
I2bb
I2bc
I2bd
I2be


alkyl
H
H
alkyl*
IIIa
alkyl
H
H
O-alkyl*
IIIb
alkyl
H
O
alkyl*
IIIc
alkyl
O-alkyl*
IIIc

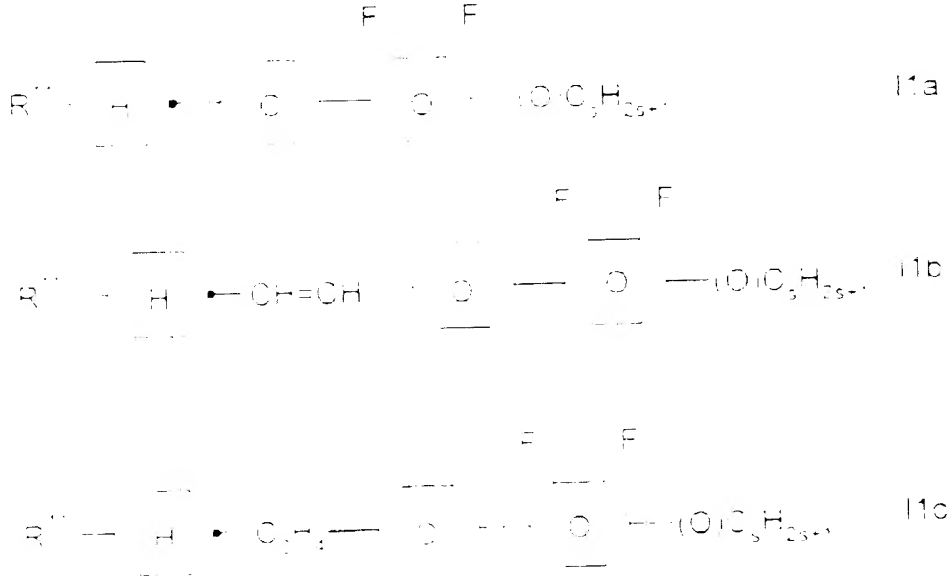

F
F
R1
H
O
O
H
CnH2n+1
F
F
F
F
R2
H
O
O
H
CxH2x+1





in which R^{20}, R^{21} and R^{22} are each, independently of the other, as defined for R^{1}, R^{2} and R^{3}, and c and d are each, independently of the another, 1 or 2, R^{5} is H, CH$_3$, C$_2$H$_5$ or n-C$_3$H$_7$.

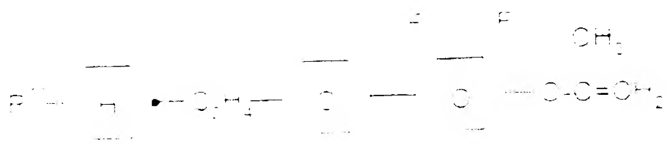
A medium in which the compounds of the formula I is selected from the group consisting of IIa to IIg:



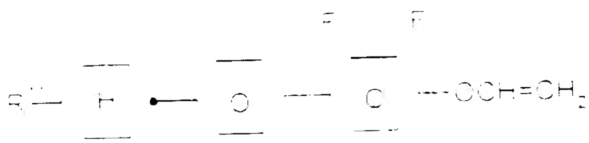
IIa

IIb

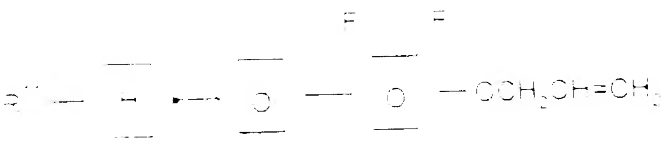
IIc



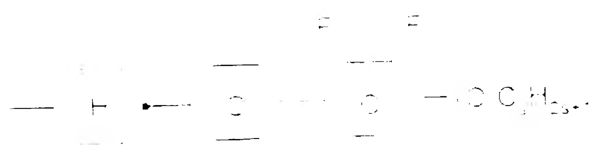
IId



IIe



IIf



IIg

in which R[illegible] is as defined above, and s is [illegible]. R[illegible] is preferably straight-chain alkyl having [illegible] carbon atoms, vinyl, 1E-alkenyl or 3E-alkenyl.

A medium which comprises one or more compounds of the formula [illegible].

A medium which additionally comprises [illegible] compounds of the formula

in which R [illegible]

[illegible]

disubstituted biphenyl, phenylcyclohexane and cyclohexylcyclohexane systems, 2,5-disubstituted pyrimidine and 1,3-dioxane rings, 2,6-disubstituted naphthalene, di- and tetrahydronaphthalene, quinazoline and tetrahydroquinazoline,

G is	-CH=CH-	-N(O)=N-
	-CH=CY-	-CH=N(O)-
	-C≡C-	$-CH_2-CH_2-$
	-CO-O-	$-CH_2-O-$
	-CO-S-	$-CH_2-S-$
	-CH=N-	-COO-Phe-COO-

or a C-C single bond, Y is halogen, preferably chlorine, or -CN, and R' and R'' are each alkyl, alkenyl, alkoxy, alkanoyloxy or alkoxycarbonyloxy having up to 18, preferably up to 8, carbon atoms, or one of these radicals is alternatively CN, NC, NO_2, NCS, CF_3, F, Cl or Br.

In most of these compounds, R' and R'' are different from one another, one of these radicals usually being an alkyl or alkoxy group. However, other variants of the proposed substituents are also common. Many such substances or mixtures thereof are commercially available. All these substances can be prepared by methods which are known from the literature.

It will be appreciated by a person skilled in the art that the SSFLC mixtures of the invention may also comprise compounds in which, for example, H, N, O, Cl, F have been replaced by the corresponding isotopes.

[illegible]

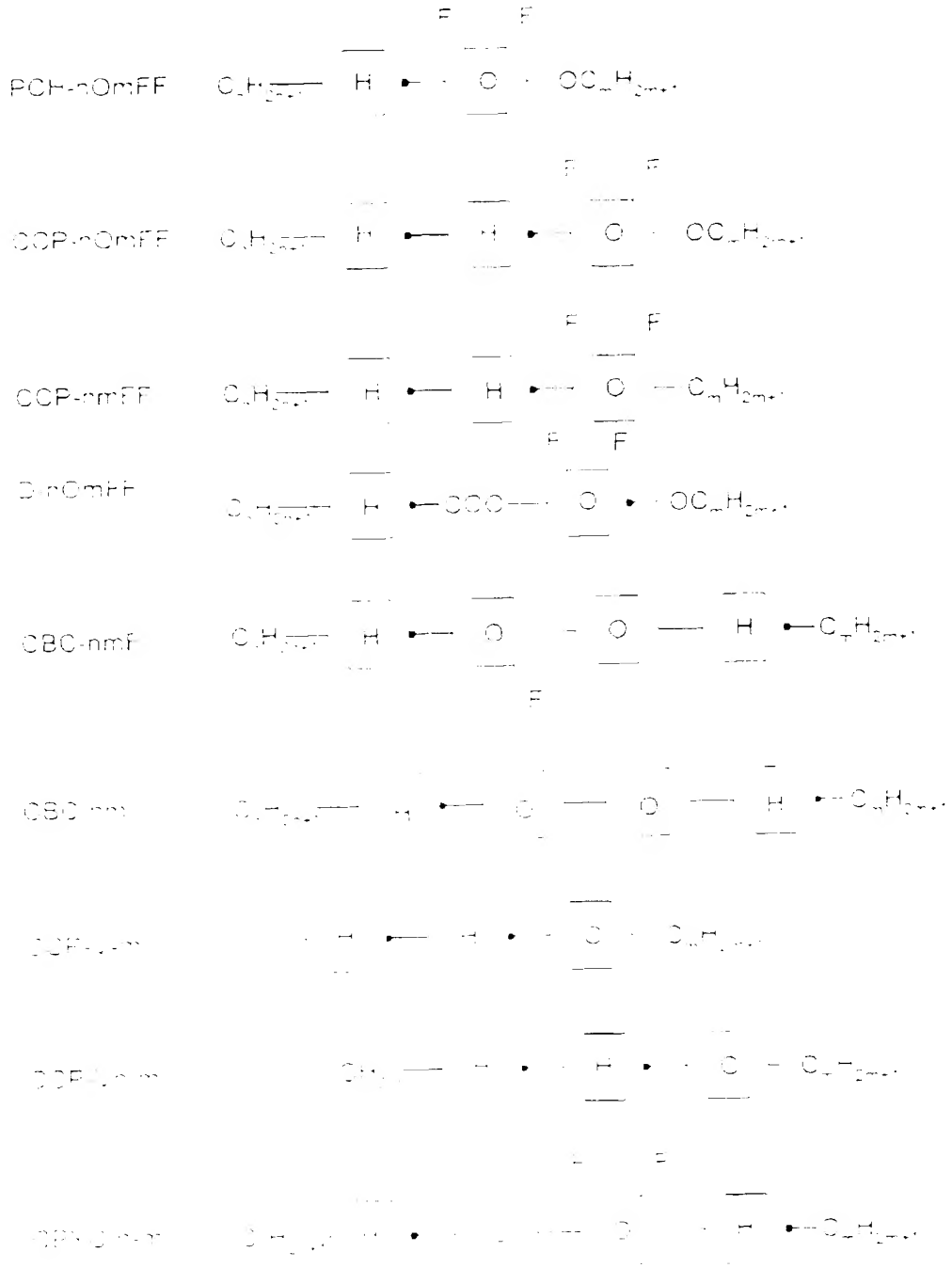
Without further elaboration, it is believed that one skilled in the art can, using the preceding description, utilize the present invention to its fullest extent. The following preferred specific embodiments are, therefore, to be construed as merely illustrative, and not limitative of the remainder of the disclosure in any way whatsoever.

In the foregoing and in the following examples, all temperatures are set forth uncorrected in degrees Celsius; and, unless otherwise indicated, all parts and percentages are by weight.

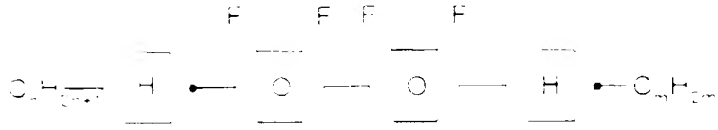
The entire disclosure of all applications, patents and publications, cited above, and of corresponding German application No. DE [illegible], filed April 14, [illegible], is hereby incorporated by reference.

Besides the compounds of the formulae I and II, the liquid-crystal mixtures according to the invention preferably comprise one or more of the compounds mentioned below.

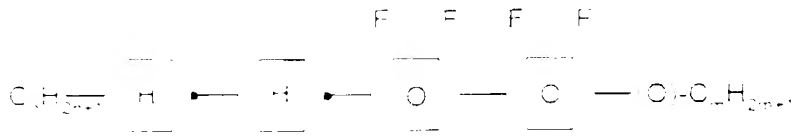
The following abbreviations are used:
(n, m = 1-6; z = 1-6)


PCH-nOmFF
CCP-nOmFF
CCP-nmFF
CBC-nmF

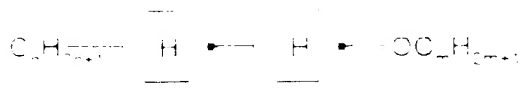
CYYC-n-m



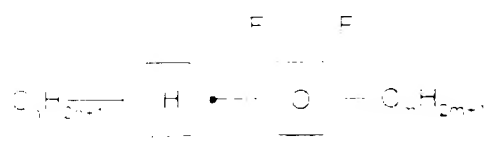
CCYY-n-Om



CCH-nOm



CY-n-m



CCH-nm

CC-n-V

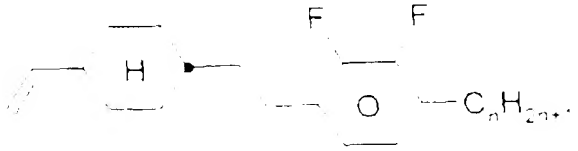
CC-n-Vm

CP-n-OmFF

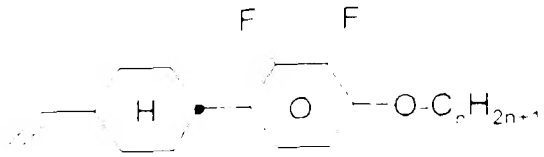
PGP-n-m

PGU-n-F

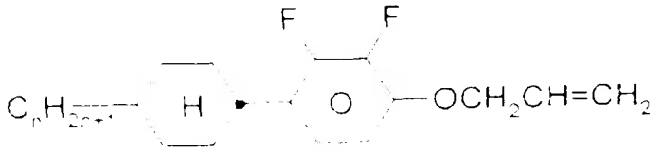
CVY-V-n



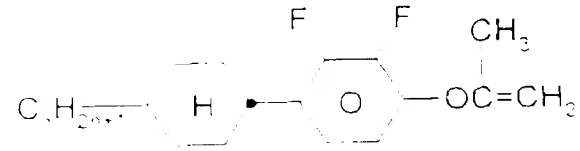
CY-V-On



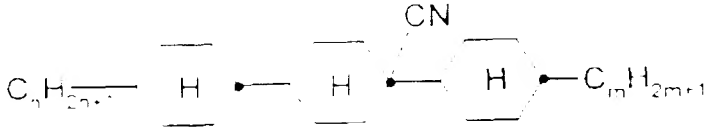
CY-n-O1V



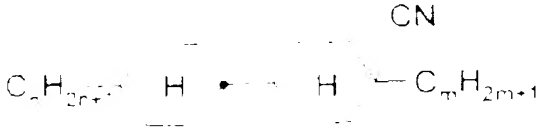
CY-n-OC(CH$_3$)=CH$_2$



BCN-nm

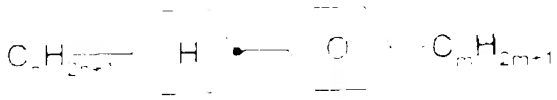


CCN-nm



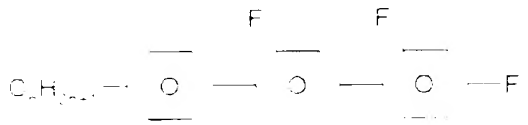
CY-n-OV

PCH-nm



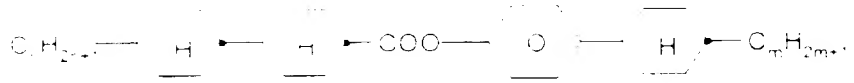
PCH-nOm

PGIGI n-F

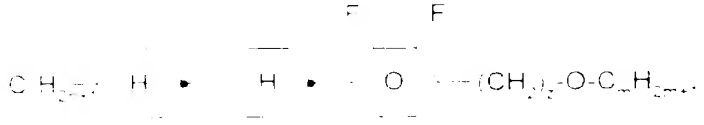


BCH-nm

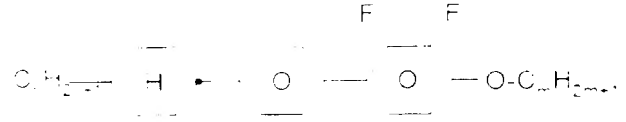
CCPC-nm



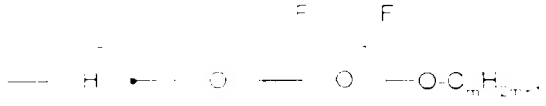
CCY-n-zCm



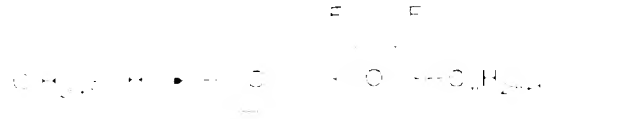
CPY-n-Om



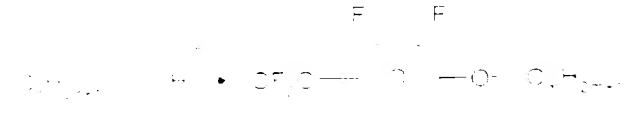
CPY-V-Om



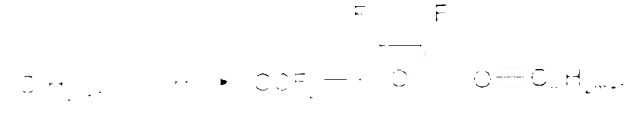
CPY-n-m



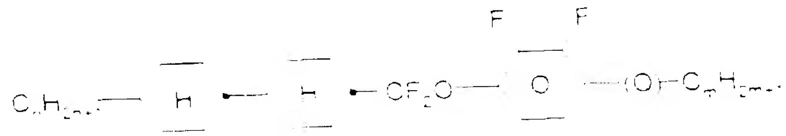
CQY-n-Om



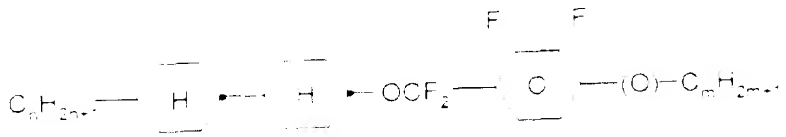
CQY-n-Cm



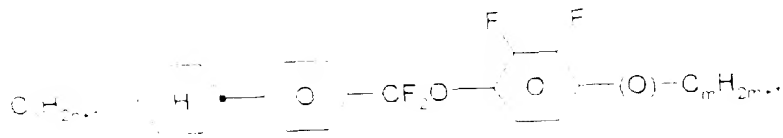
CCQY-n-(O)m



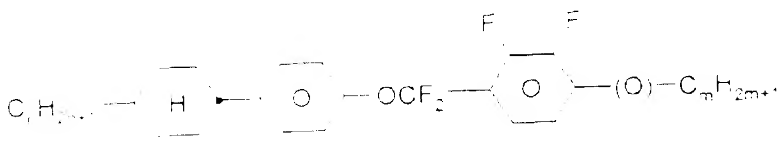
CCQIY-n-(O)m



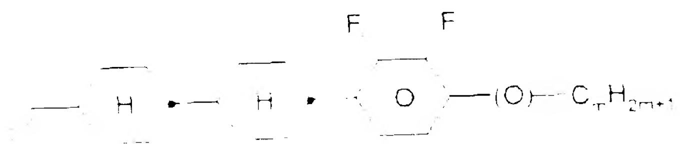
CPQY-n-(O)m



CPQIY-n-(O)m



CCY-V-(O)m



The abbreviations furthermore have the following meanings:

[illegible]

Δn optical anisotropy measured at [illegible] °C and 589 nm

Δε [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
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